

## الاية

بسم الله الرحمن الرحيم

{تَبَارَكَ الَّذِي جَعَلَ فِي السَّمَاءِ بُرُوجًا وَجَعَلَ فِيهَا سِرَاجًا وَقَمَرًا مُنِيرًا (61) وَهُوَ الَّذِي جَعَلَ اللَّيْلَ وَالنَّهَارَ خِلْفَةً لِمَنْ يُرَادُ أَنْ يَذْكُرَ أَوْ أَرَادَ شُكُورًا (62) وَعِبَادُ الرَّحْمَنِ الَّذِينَ يَمْشُونَ عَلَى الْأَرْضِ هَوْنًا وَإِذَا خَاطَبَهُمُ الْجَاهِلُونَ قَالُوا سَلَامًا (63) وَالَّذِينَ يَبِيتُونَ لِرَبِّهِمْ سُجَّدًا وَقِيَامًا (64) وَالَّذِينَ يَقُولُونَ رَبَّنَا اصْرِفْ عَنَّا عَذَابَ جَهَنَّمَ إِنَّ عَذَابَهَا كَانَ غَرَامًا (65) إِنَّهَا سَاءَتْ مُسْتَقَرًّا وَمُقَامًا (66) وَالَّذِينَ إِذَا أَنْفَقُوا لَمْ يُسْرِفُوا وَلَمْ يَقْتُرُوا وَكَانَ بَيْنَ ذَلِكَ قَوَامًا (67) وَالَّذِينَ لَا يَدْعُونَ مَعَ اللَّهِ إِلَهًا آخَرَ وَلَا يَقْتُلُونَ النَّفْسَ الَّتِي حَرَّمَ اللَّهُ إِلَّا بِالْحَقِّ وَلَا يَزْنُونَ وَمَنْ يَفْعَلْ ذَلِكَ يَلْقَ أَثَامًا (68) يُضَاعَفْ لَهُ الْعَذَابُ يَوْمَ الْقِيَامَةِ وَيَخْلُدْ فِيهِ مُهَانًا (69) إِلَّا مَنْ تَابَ وَآمَنَ وَعَمِلَ عَمَلًا صَالِحًا فَأُولَئِكَ يُبَدِّلُ اللَّهُ سَيِّئَاتِهِمْ حَسَنَاتٍ وَكَانَ اللَّهُ غَفُورًا رَحِيمًا (70) }

صدق الله العظيم

سورة الفرقان

## DEDICATION

All The regards & appreciation to my  
Dear Lovable Mother **Afaf Elsamanii** for  
her understanding and assistance , and  
for her help and inspiration she  
.extended

To My Father's Soul, **Dr. Mohamed  
Osman Ali**, Who was the Source of my  
Ambition and Guidance throughout all  
.the way of my Success

To My Beloved Wife **Amna Hamza**  
.and my Son **Mohamed Osman**

To My Dearest Aunt **Fatheyah  
Elsamanii**, who encouraged and  
.Supported me

To My Friend **Mohamed Elkhatim**  
who was with me through every step of  
.my Life Journey

## Acknowledgement

I would like to acknowledge and extend my heartfelt gratitude to the following persons who have made the completion of this Research To The University of Sudan For Science and Technology Whom its Facilities initiated the Result of this .research

For all my Tutors in the University & the Faculty Members and Staff & for the constant reminders and much needed .motivation

Special regards and appreciation to  
Our Supervisor  
**Dr. Mohamed Noor**, for his vital  
.encouragement and support

## **ABSTRACT**

This research presents a MATLAB simulation of fuzzy traffic controller for controlling traffic flow at multilane isolated signalized intersection. The controller is developed based on the waiting time and vehicles queue length at current green phase, and vehicles queue lengths at the other phases. For control strategy, the controller controls the traffic light timings and phase sequence to ensure smooth flow of traffic with minimal waiting time, queue length and delay time. In this research, the isolated intersection model used consists of two lanes in each approach. Each approach has two different values of vehicles queue length and waiting time, respectively, at the intersection. The maximum values of vehicles queue length and waiting times are selected as the inputs to controller for optimized control of traffic flows at the intersection. A traffic model and fuzzy traffic controller are developed to evaluate the performance of traffic controllers under different conditions. In the end, by comparing the experimental result obtained by the vehicle-actuated controller (VAC) and fuzzy traffic controller (FTC) which improves significant performance for intersections, we confirmed the efficiency of .our intelligent controller based fuzzy inference system

## المستخلص

هذا البحث يقدم محاكاة التحكم الغامض باستخدام ماثلاب لتحكم في انسياب حركة المرور لتقاطع ثنائي الاتجاه، تم تطوير وحدة التحكم على اساس وقت الانتظار وطول قائمة انتظار السيارات في مرحلة الضوء الاخضر وطول قائمة انتظار السيارات في المراحل الاخرى، استراتيجية التحكم، وحدة تحكم تسيطر على توقيت وتسلسل مرحلة اشارة المرور لضمان انسياب المرور مع الحد الادنى من طول فترة الانتظار وطول قائمة انتظار السيارات ووقت التأخير. في هذا البحث نموزج التقاطع الثنائي المستخدم يتكون من مسارين في كل اتجاه لكل اتجاه قيمتان مختلفتان من طول قائمة الانتظار ووقت الانتظار على التوالي عند التقاطع. يتم تحديد الحد الاقصى للقيم من طول قائمة انتظار السيارات وفترة الانتظار باعتبارها مدخلات وحدة التحكم للتحكم الامثل في انسياب حركة المرور في التقاطع. تم تطوير نموزج السير والمرور باستخدام التحكم الغامض بتقييم اداء مراقبي الحركة في ظل الظروف المختلفة. في الختام تمت مقارنة النتائج العملية التي تم الحصول عليها من المتحكم الغامض مع مرور السيارات التقليدي. واكد اننا لدينا تحكم كفى وزكي يستخدم نظام التحكم الغامض.

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<b>Observation</b>	<b>Revisers to</b>
AI	Artificial intelligence
CI	Computational Intelligence
CC	Classical Control
IC	Intelligent Control
PID	Proportional-integral-derivative
LQG	linear quadratic Gaussian
FLC	fuzzy logic control
MF	Membership Function
FIS	Fuzzy Inference System
COG	Center of gravity
COGS	Center of gravity method for singletons
BOA	Bisector of area
MOM	Mean of Maxima
LM	Leftmost Maximum
RM	Rightmost Maximum
FP	fuzzy proportional
FPD	fuzzy proportional-derivative
FPD+I	fuzzy proportional-derivative plus integral
FInc	fuzzy incremental
GUI	graphical user interface
FIFO	First-In-First-Out
FTC	FUZZY TRAFFIC CONTROLLER
VAC	VEHICLE-ACTUATED CONTROLLER



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